

Systematic Review of Suicide Prevention in Veterans

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Disclaimer: Drs. Denneson & Teo

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About the VA Evidence-based Synthesis Program (ESP)

Provides evidence syntheses on important clinical practice topics relevant to Veterans, and these reports help:

- develop clinical policies informed by evidence
- the implementation of effective services
- support VA clinical practice guidelines and performance measures
- guide future research to address clinical knowledge gaps

Broad topic nomination process – e.g. VACO, VISNs, field – facilitated by ESP Coordinating Center (Portland) through online process:

<http://www.hsrd.research.va.gov/publications/esp/TopicNomination.cfm>

Current report

Primary stakeholder

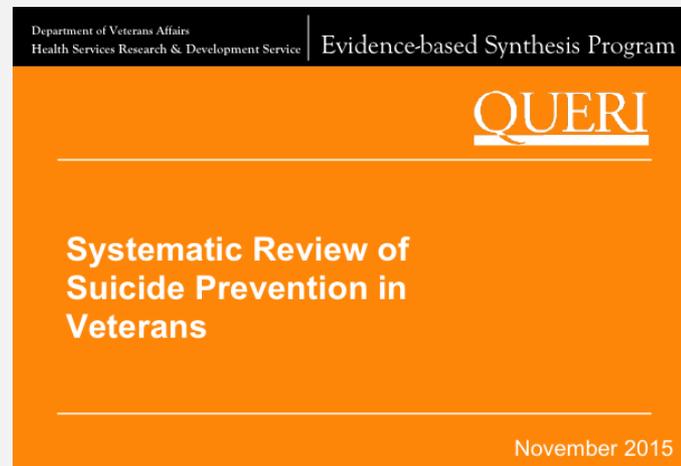
- Office of Research & Development, Department of Veterans Affairs

Primary objective

- Update previous two reports (completed 2012) to identify promising areas for future research in suicide prevention relevant to Veterans

Full report:

<http://vaww.hsrd.research.va.gov/publications/esp/reports.cfm>



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Three things you will be able to do after today's session are...

Describe the accuracy of several methods of suicide risk assessment in detecting suicide or suicide attempts



Describe recent evidence for interventions to reduce suicide in military and veteran populations



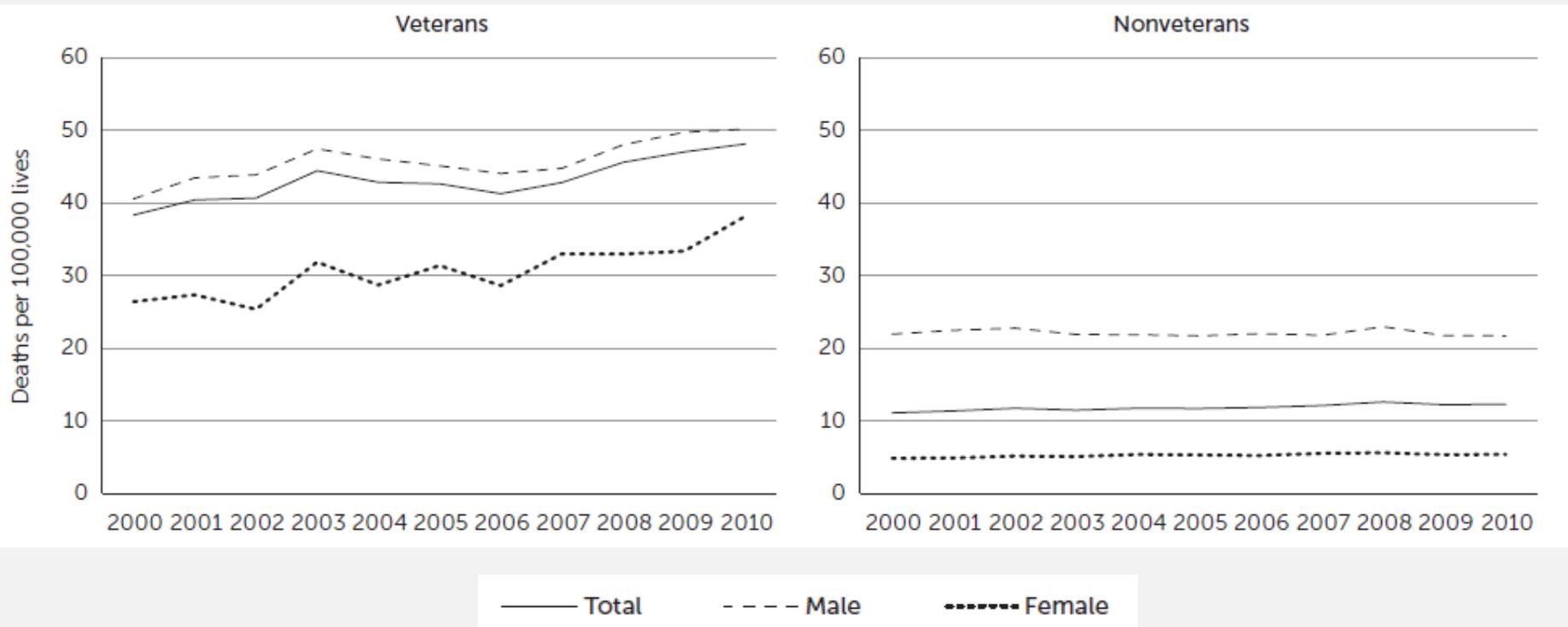
Identify challenges for future work on translating suicide prevention research to routine clinical practice



Overview

- **Background**
- Results on risk assessment methods
- Results on interventions
- Take-home points and future directions
- Q&A

Suicide rates among Veterans are high



Source: Hoffmire, et al. Changes in Suicide Mortality for Veterans and Nonveterans by Gender and History of VHA Service Use, 2000-2010. *Psychiatric Services*, 2015;66(9):959-65 .

VHA's role in suicide prevention

Clinicians often see Veterans shortly before a suicide attempt

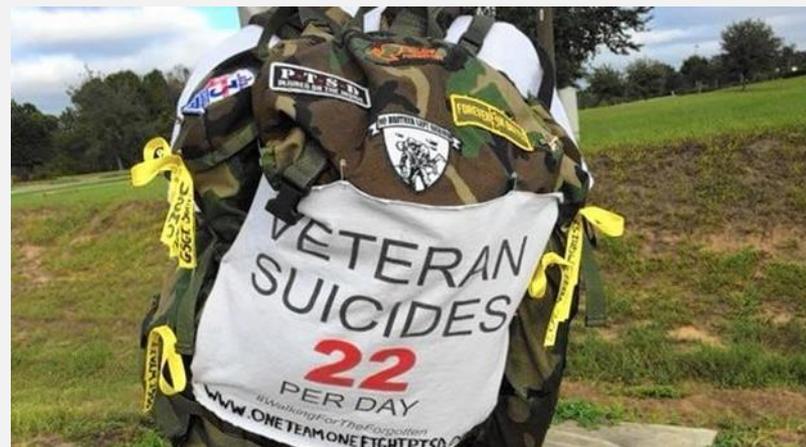


Image: Jerry Fallstrom, Orlando Sentinel

Suicide Attempts (Kemp & Bossarte, 2012)

- 80% contact VHA care within 4 weeks of a suicide attempt

Suicides (Basham et al., 2010)

- 43% contact mental health during the year prior to death
- 66% contact primary care during the year prior to death

Some VHA suicide prevention activities

- Identify those who may be at risk (and document risk)
 - VHA-wide staff training on suicide prevention
 - Suicidal ideation assessments
 - Suicide behavior reports
 - High risk flag
- Intervene, provide follow-up, or referrals
 - Patient education
 - Suicide prevention coordinators
 - Safety planning
 - Referrals to mental health care
 - Veterans crisis line/veterans chat

Safety Plan

STEP 1: KNOW WHEN TO FIND HELP _____ »
What are the warning signs when you begin thinking of suicide or when you feel very distressed? These can include thoughts, moods, images, or behaviors.

STEP 2: COPING SKILLS _____ »
What can you do by yourself to take your mind off of the problem? What obstacles might there be to using these coping skills?

STEP 3: SOCIALIZING WITH FRIENDS AND FAMILY _____ »
If you are unable to deal with your distressed mood alone, contact trusted family members or friends. List several people in case your first choices are not available.

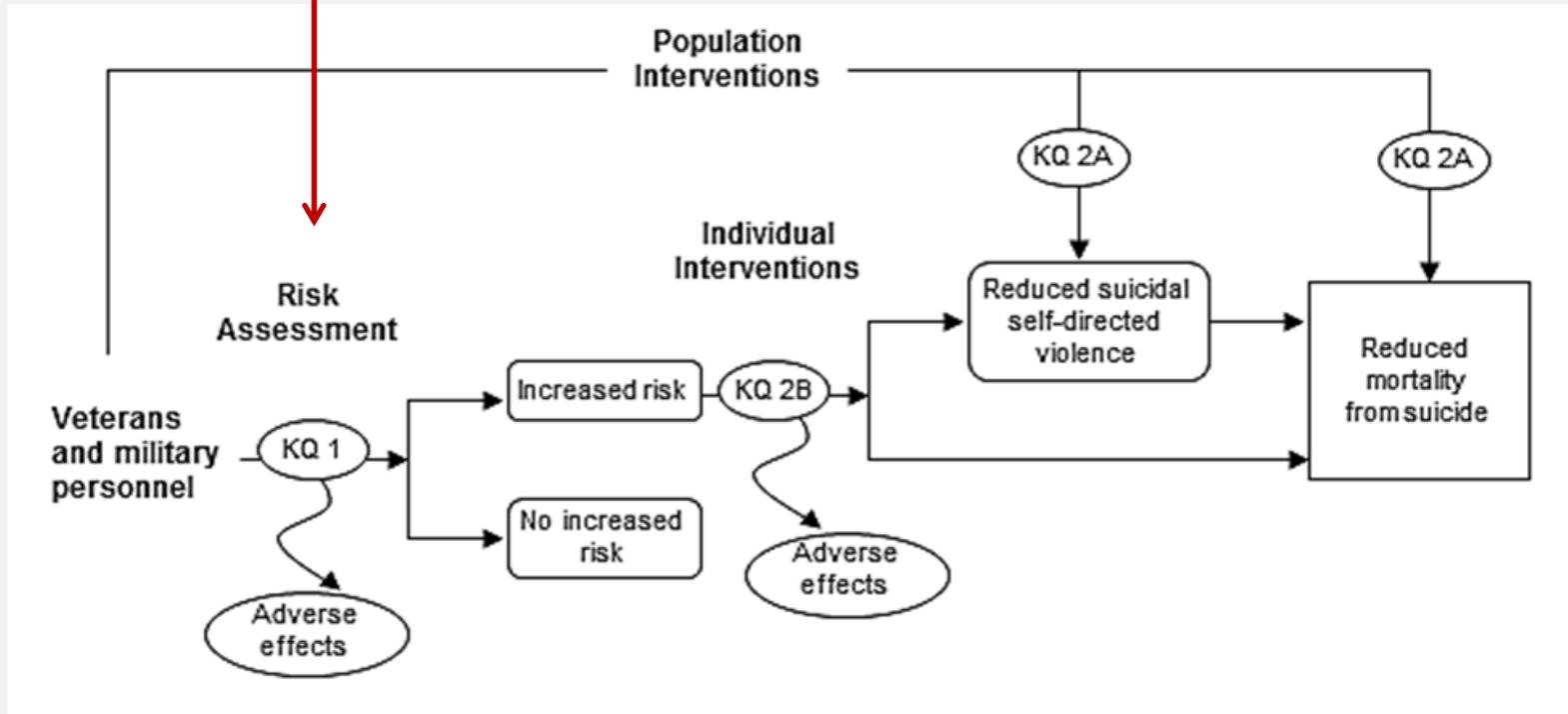
NAME	PHONE NUMBER

STEP 4: CONTACT PROFESSIONALS AND AGENCIES _____ »
Contact local professionals or emergency services if you continue to have suicidal thoughts or serious distress.

Local emergency number	
Local professional or agency	
Suicide hotlines in the United States	1-800-SUICIDE 1-800-273-TALK 1-800-799-4889 (for deaf or hard of hearing)

Provided by TherapistAid.com © 2012

Key Question 1

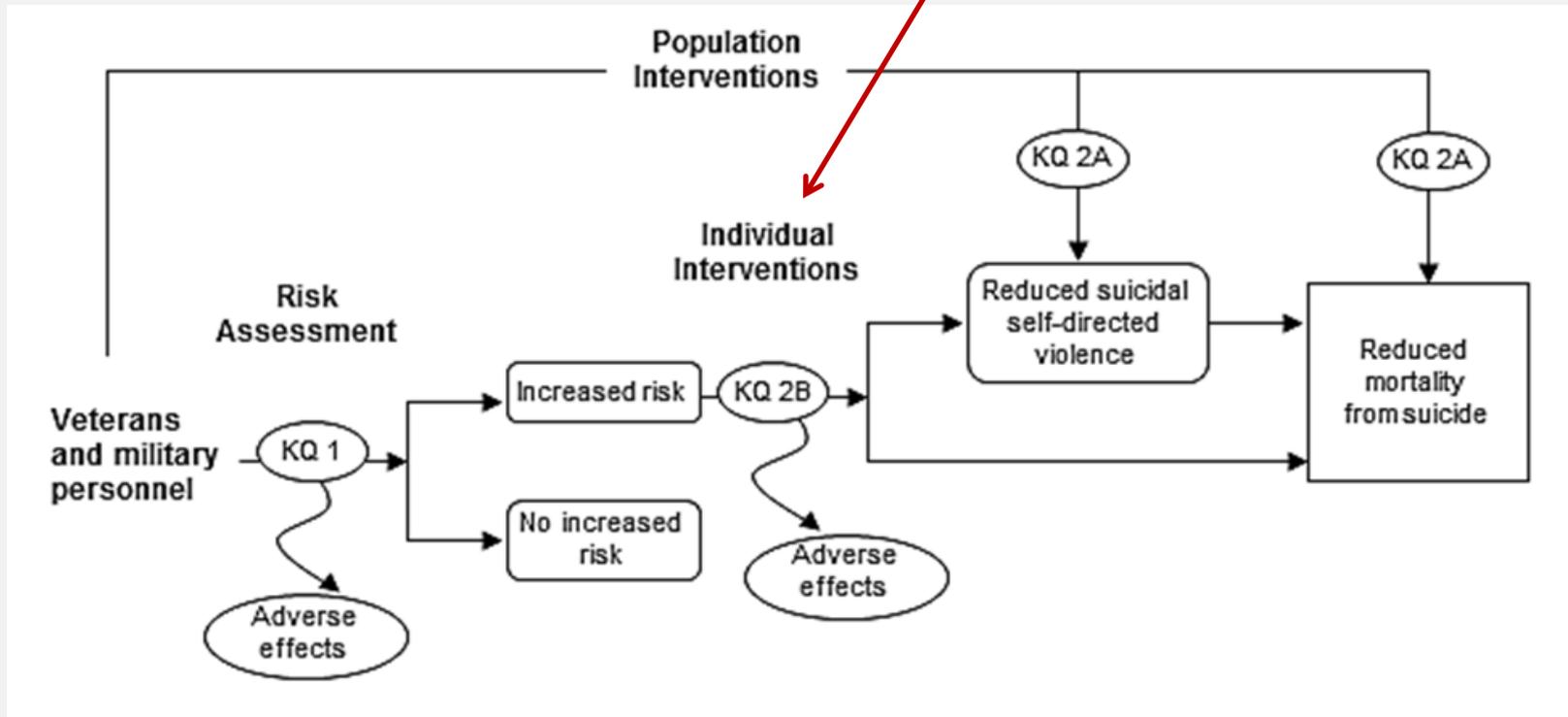


Key Questions

Key Question #1.

- A. What are the accuracy and adverse effects of methods to identify Veterans and military personnel at increased risk for suicide and other suicidal self-directed violence?
- B. Does accuracy and adverse effects vary by settings, delivery modes, targeted populations, or other factors?

Key Question 2



Key Questions

Key Question #2.

What are the efficacy/effectiveness and adverse effects of suicide prevention interventions in reducing rates of suicide and other suicidal self-directed violence in Veterans and military personnel?

Interventions include healthcare services directed towards:

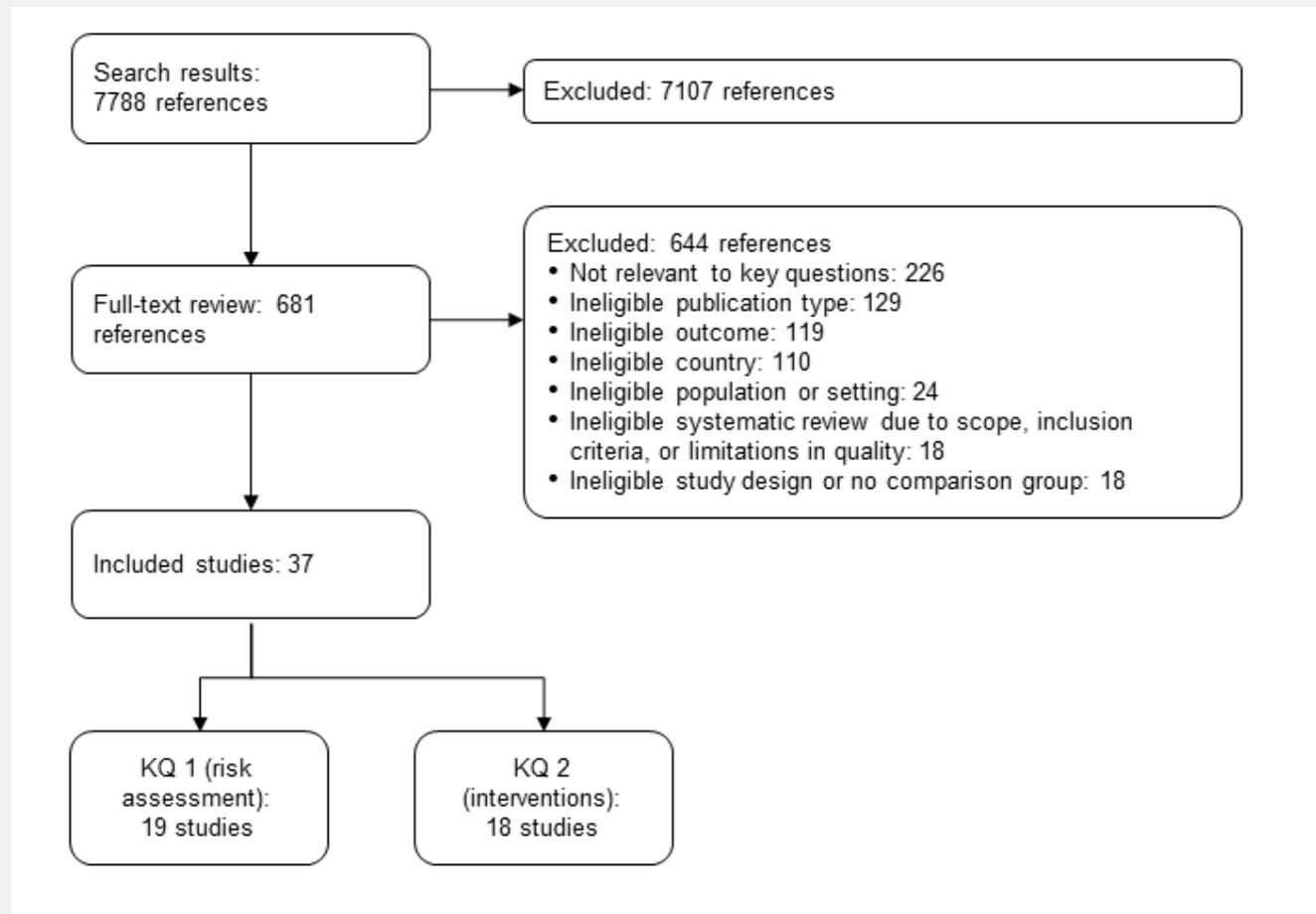
- Populations (eg, hotlines, outreach programs)
- Individuals (eg, case management, follow-up)

Key Questions

Key Question #3.

What are important areas of ongoing research and current evidence gaps in research on suicide prevention in Veterans and military personnel, and how could they be addressed by future research?

Literature Reviewed (Jan '08- Sept. '15)



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19 studies evaluated...

19 different approaches

Of the 19 studies included on methods to identify suicide risk...

13

Clinician-rated
Self-report



6

Database

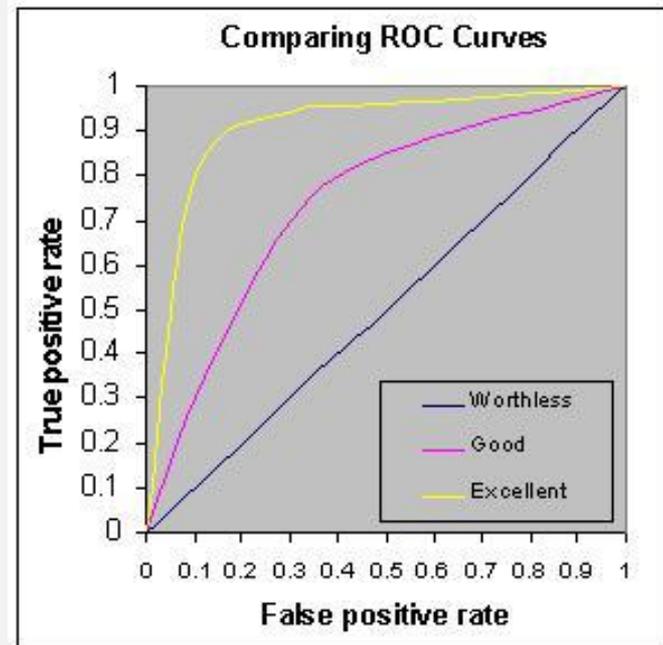


To evaluate studies of suicide risk assessment we looked at **accuracy** in **classifying** individuals into groups with and without the study outcome



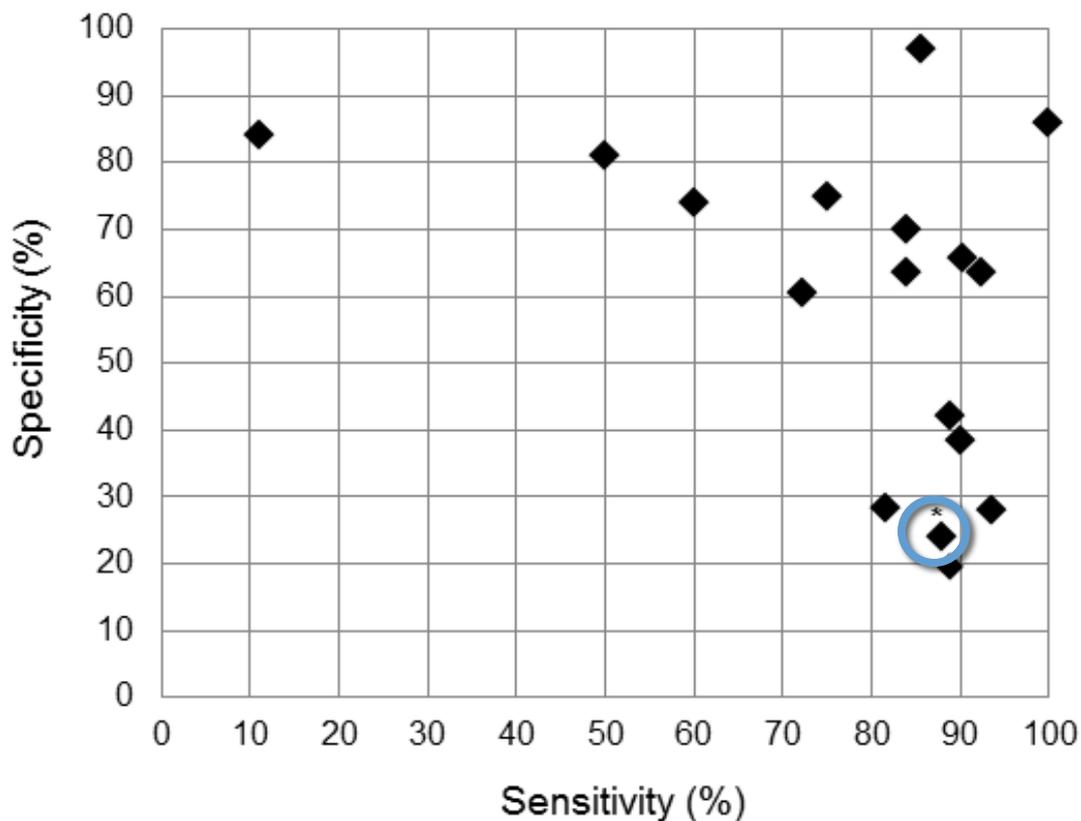
Fair or better accuracy is...

- **Sensitivity** $\geq 80\%$
- Correctly identify “**true positives**”
- Proportion of patients who have a suicide outcome and whose test result is positive
- Area under the ROC curve (**AUC**) ≥ 0.70



Most methods had fair or better accuracy discriminating patients with and without suicide or suicide attempts

- (Modified) SAD PERSONS Checklist
- Suicide Opinion Questionnaire
- ReACT Self Harm Rule
- Suicidal Ideation Attributes Scale
- Modified Affective Intensity Rating Scale
- Suicide Trigger Scale
- Schedule for Nonadaptive and Adaptive Personality: *Self-Harm Subscale*
- Personality Assessment Inventory: *Suicide Potential Subscale*
- Tiet 2006 decision tree
- Database-derived prediction models



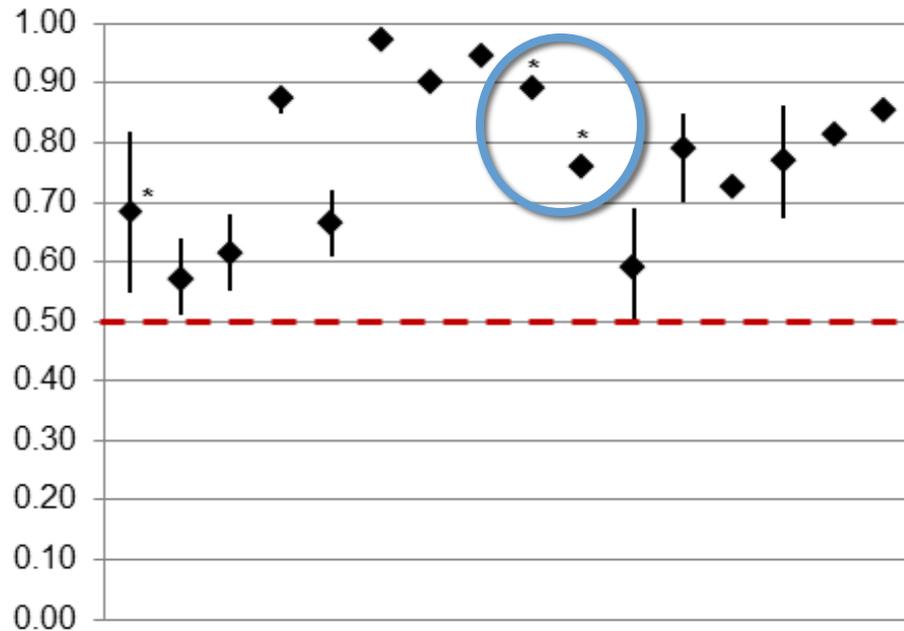
*ReACT Self Harm Rule³⁴ study reported suicide outcomes; 2 studies included suicides and attempts combined;^{22,40} all other studies reported suicide attempts.

†Results for validation set.

‡6-item subscale.

Study	Sensitivity (%)	Specificity (%)
Bolton, 2012 ²⁷		
SAD PERSONS	88.8	19.6
Modified	81.6	28.3
9-items	90.4	65.6
5-items	93.5	27.9
Breshears, 2010 ²²		
Suicide Potential Index	100	86
Galfalvy, 2008 ²⁸		
3-term model	75	75
Galynker, 2015 ²⁹		
Suicide Opinion Questionnaire	85.7	97
Hartl, 2005 ²³		
Beck Depression Inventory†	11	84
Hendin, 2010 ²⁴		
Affective States Questionnaire	60	74
Nock, 2010 ³²		
Implicit Association Test	50	81
Steeg, 2012 ³⁴		
ReACT Self Harm Rule†	88	24
Yen, 2011 ⁴⁰		
VA decision tree	89	42
Van Spijker, 2014 ³⁶		
Suicide Ideation Attributes Scale	84	63.6
Yaseen, 2012 ³⁸		
Suicide Trigger Scale	72.2	60.5
Yaseen, 2014 ³⁹		
Suicide Trigger Scale‡	92.3	63.4
Yaseen, 2012 ³⁷		
Affective Intensity Rating Scale	90.0	38.4
Yen, 2011 ⁴⁰		
SNAP-SH	84	70

Area Under the Receiver-Operator
Characteristic Curve (AUC)



Individual Studies (order follows the table)

*Three studies reported suicide outcomes;^{26,30,31} 3 studies included suicides and attempts combined;^{22,35,40} all other studies reported suicide attempts.

†20-item model.

‡6-item subscale.

Study	AUC (95% CI)
Bernert, 2014 ²⁶ Sleep Quality Index	0.685 (0.549 to 0.820)
Bolton, 2012 ²⁷ SAD PERSONS Modified 9-items	0.572 (0.51 to 0.64)
5-items	0.613 (0.55 to 0.68)
Breshears, 2010 ²² Suicide Potential Index	0.874 (0.85 to 0.89)
Galfalvy, 2008 ²⁸ 40-term model	0.665 (0.61 to 0.72)
Galynker, 2015 ²⁹ Suicide Opinion Questionnaire†	0.972
Kessler, 2015 ³⁰ Army STARRS model	0.90
McCarthy, 2015 ³¹ VA model	0.89
Tran, 2014 ³⁵ Barwon Assessment	0.761 (0.751 to 0.771)
Electronic Medical Record model	0.59 (0.50 to 0.69)
Yaseen, 2012 ³⁸ Suicide Trigger Scale	0.79 (0.70 to 0.85)
Yaseen, 2014 ³⁹ Suicide Trigger Scale‡	0.724
Yaseen, 2012 ³⁷ Affective Intensity Rating Scale	0.814
Yen, 2011 ⁴⁰ SNAP-SH	0.744
	0.855

A focus on 3 studies, all with 4 qualities:

Accuracy

Outcome

Risk of Bias

Applicability

Steeg 2012: ReACT Self Harm Rule

Data set: 18,680 ER patients in England with self-harm

Tool: 4 clinician-rated items: self-harm in last year, living alone/homeless, cutting behavior, treatment for current psychiatric disorder

Accuracy: Sensitivity, 88%; specificity, 24%

Outcome: Suicide within 6 months

Risk of bias: Low

Applicability: Moderate

Kessler 2015: Army STARRS model

Data set: 40,820 active duty Army soldiers hospitalized with psychiatric diagnoses

Tool: Machine-learning derived risk algorithm using data from administrative data systems (20 to 421 predictor variables)

Accuracy: AUC's as high as 0.89

Outcome: Suicide within 1 year

Risk of bias: Low

Applicability: High

McCarthy 2015: VA model

Data set: ~6 million active VA patients

Tool: Prediction model derived from VA administrative data
(381 variables)

Accuracy: AUC = 0.76

Outcome: Suicide within 1 year

Risk of bias: Low

Applicability: High

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Population-level Interventions

Eight population-level studies

Shared across interventions: Multifaceted approaches including:

- education,
- awareness,
- enhanced screening,
- treatment,
- engaging stakeholders at multiple levels

Some population-level interventions are beneficial?

Lower suicide rates observed post intervention for 6 interventions, targeting:

- **The Air Force** (Knox, 2010; Knox 2003)
- **An Army Infantry Division deployed to Iraq** (Warner, 2011)
- **Police officers** (Mishara, 2012)
- **University students** (Joffe, 2008)
- **Health systems** (Coffey, 2007; While, 2012)

- Risk of bias: Interventions were non-randomized, potential confounders not considered, comparison groups may not have been adequate

- Evidence grade: low (suicide)

Individual-level Interventions

10 individual-level studies

Most were trials of psychotherapy: cognitive behavioral therapy, dialectical behavioral therapy, personal construct psychotherapy, and problem-solving therapy

Some individual-level interventions are promising?

Two trials reported statistically significant differences between treatment and usual care:

1. **Outpatient active-duty soldiers with recent suicidal ideation receiving brief cognitive behavioral therapy** (Rudd, 2015)
 - 13.8% vs. 40.2%, $p=.02$ (attempts, intervention vs. control)
 2. **Women with borderline personality disorder receiving dialectical behavioral therapy** (Linehan, 2006)
 - 23% vs. 46%; $p=.01$ (attempts, intervention vs. control)
- Risk of bias: allocation concealment, unclear or lack of specified outcome measures
 - Evidence grade: insufficient (suicide) and low (attempt)

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Lesson 1

Conclusion: New methods in identifying patients with and without suicide attempts or death by suicide continue to be developed and seem reasonably accurate. 😊

Caveat: *But study results are generally not being replicated or extended to additional clinical contexts.* 😞

In other words...

Develop → Test → Extend

Lesson 2

Conclusion: Prediction models derived from large patient databases may provide a more rigorous approach to risk assessment than other methods. 😊

Caveat: *Feasibility of these models clinical practice is unclear.* 😞



Lesson 3

Conclusion: Studies of suicide prevention interventions provide inconclusive evidence. 😞

Caveat: *Low incidence of suicide is a major challenge to suicide prevention research.* 😊/😞

Future directions for research

- Include assessment of adverse effects
- Build on the existing base of risk assessment methods
- Refine previously studied interventions
 - For population-level studies, use robust but practical observational study designs (e.g., interrupted time-series analysis), strengthen choice of comparison groups
 - For individual-level studies, improve sample selection and replicate with larger RCTs
- Explore promising highly novel approaches
 - Computer-administered Implicit Association Test
 - Biological markers
 - Technological “mHealth” interventions
 - Test interventions that increase protective factors (e.g., social integration)

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